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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,453	09/05/2003	Yuan Wu	03-SIN-092	8429
7590 Lisa K. Jorgenson, Esq. STMicroelectronics, Inc. 1310 Electronics Drive Carrollton, TX 75006			EXAMINER PAUL, DISLER	
			ART UNIT 2614	PAPER NUMBER
			MAIL DATE 09/16/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/656,453

**Applicant(s)**

WU ET AL.

**Examiner**

DISLER PAUL

**Art Unit**

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 4-6;13-17;30-31;33-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 33;38;30-31;40-43 is/are rejected.
- 7) ☒ Claim(s) 4-6;34-37;13-17;39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Allowable Subject Matter***

Claims 34; (35, 4-6); 36-37; (39,13-17) are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

RE claim 34, none of the prior art of record disclose as in combination the specific wherein a second combiner configured to produce second output signals for a second physical speaker using an output of the forward crossover path; a first feedback crossover path configured to receive, delay, and filter the first output signals, the second combiner further configured to produce the second output signals using an output of the first feedback crossover path; and a second feedback crossover path configured to receive, delay, and filter the second output signals, the first combiner further configured to produce the first output signals using an output of the second feedback crossover path.

Similarly, RE claims 35 has been analyzed and objected for similar reason as in claim 34.

Re claim 39, none of the prior art of record disclose as in combination the specific wherein one or more first combiners operable to produce first output signals for a first physical speaker using one or more of: one or more of the input signals, one

or more outputs from the filters, and one or more outputs from the forward crossover paths and one or more second combiners operable to produce second output signals for a second physical speaker using one or more of: one or more of the input signals, one or more outputs from the filters, and one or more outputs from the forward crossover paths; a first feedback crossover path operable to receive, delay, and filter the first output signals, the one or more second combiners further operable to produce the second output signals using an output from the first feedback crossover path.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota (US 7424121 B2) and Davis et al. (US 6449368 B1).

Re claim 33, Kubota disclose of an audio processor, comprising: a virtualizer configured to process audio information to virtualize at least one speaker such that, from a listener's perspective, sounds appear to come from at least one direction where a physical speaker is not present (fig.5 (2); fig.6; col.1 line 30-50; col.4 line 10-15) and a controller configured to cause the virtualizer to virtualize the at least one speaker at any location in a space around the listener (fig.5 (1); col.1 line 14-20; col.3 line 60-67).

However, Kubota never specify of the virtualizer comprising a first feedback crossover path configured to receive, delay, and filter signals output from the virtualizer. But, Davis et al. disclose of a system wherein the similar concept of having such a first feedback crossover path configured to receive, delay, and filter signals output from the virtualizer (fig.5 (24,26); col.13 line 20-40; crosstalk feedback with delay and filter) so as to create phantom or virtual images-sound apparently come from directions of the original channel. Thus, it would have been obvious for one of the ordinary skill in the art to have modified the combination with incorporating the first feedback crossover path configured to receive, delay, and filter signals output from the virtualizer so as to create phantom or virtual images-sound apparently come from directions of the original channel.

Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota (US 7424121 B2) and Kasai et al. (US 7242782 B1).

Re claim 38, Kubota disclose of a device, comprising: an audio source operable to provide audio information (fig.4 (3); col.3 line 60-62; col.4 line 1-9); and an audio processor operable to receive the audio information and process the audio information to virtualize at least one speaker so that, from a listener's perspective, sounds appear to come from at least one direction where a physical speaker is not present, the audio processor being configurable to virtualize the at least one speaker at any location in a

space around the listener (fig.4 (2); fig.2 (2); col.4 line 10-25); and wherein the audio processor comprises: a virtualizer configured to process audio information to virtualize the at least one speaker (fig.2-3 (2); col.5 line 5-11) and a controller configured to cause the virtualizer to virtualize the at least one speaker (fig.1-2 (1); col.3 line 54-60).

However, Kubota never specify of the virtualizer to virtualize the at least one speaker by individually altering a frequency response of one or more of the filters and a delay of one or more of the delay lines.

But, Kasai disclose of a virtualizer to virtualize the loudspeakers by individually altering a frequency response of one or more of the filters and a delay of one or more of the delay lines (fig.19 (120a, 1208); col.12 line 37-47/each of the filter being individually alter the frequency response and a delay line is being adjusted as in compensation in creating the surround sound speaker image) so as to improve the accuracy in the low frequency component of the sound image. Thus, it would have been obvious for one of the ordinary skill in the art to have modified the combination with having such virtualizing the loudspeakers by individually altering a frequency response of one or more of the filters and a delay of one or more of the delay lines for improving the accuracy in low component of the sound image.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 40-41; 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Davis et al. (US 6449368 B1).

Re claim 40, Davis et al. disclose of a method, comprising: generating first output signals for a first physical speaker and generating second output signals for a second physical speaker (fig.1; 5; col.2 line 34-46; 64-67); and providing at least one of the first output signals and the second output signals to at least one feedback crossover path operable to receive, delay, and filter the second output signals (fig.1; 5; col.3 line 35-45).

Re claim 41, The method of Claim 40, wherein providing further comprises: providing the second output signals to a first feedback crossover path operable to receive, delay, and filter the second output signals; and providing the first output signals to a second feedback crossover path operable to receive, delay, and filter the first output signals (fig.1; 5).

Re claim 43 ; the method of Claim 40, further comprising: filtering one or more input signals to produce one or more filtered input signals (fig.5 (60)) ; providing one or more of the filtered input signals to one or more forward crossover paths (fig.5 (64,74)); and generating the first and second output signals using one or more of: one or more of the input signals, one or more of the filtered input signals, and one or more outputs from

the forward crossover paths (fig.5 (60,64,74)) ; wherein generating the first output signals further comprises using an output from the second feedback crossover path; wherein generating the second output signals further comprises using an output from the first feedback crossover path (fig.1; fig.5); an wherein the first output signals emulate effects of a virtual speaker on one ear of a listener, the second output signals emulate effects of the virtual speaker on another ear of the listener, and each of the output signals at least partially cancels crosstalk caused by the other output signals (fig.5; col.3 line 35-50; col.4 line 53-67).

Claims 42; 30-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Davis et al. (US 6449368 B1) and Kasai et al. (US 7242782 B1).

Re claim 42, the method of Claim 41, wherein the first and second output signals are produced using one or more first filters (fig.5 (60)) , one or more forward crossover paths each comprising a first delay line and a second filter (fig.5 (64,74)) and two feedback crossover paths each comprising a second delay line and a third filter (fig.5; fig.1/with the cross over feedback signal).

However, Davis et al. fail to disclose of such specific as individually altering a frequency response of one or more of the filters and a delay of one or more of the delay lines to change the location of one or more of the virtualized speakers.



But, Kasai disclose of a such individually altering a frequency response of one or more of the filters and a delay of one or more of the delay lines to change the location of one or more of the virtualized speakers (fig.19 (120a, 1208); col.12 line 37-47/each of the filter being individually alter the frequency response and a delay line is being adjusted as in compensation in creating the surround sound speaker image) so as to improve the accuracy in the low frequency component of the sound image. Thus, it would have been obvious for one of the ordinary skill in the art to have modified the combination with having such individually altering a frequency response of one or more of the filters and a delay of one or more of the delay lines to change the location of one or more of the virtualized speakers for improving the accuracy in low component of the sound image.

Re claim 30, the method of Claim 42, wherein the first and second output signals emulate the effects of multiple virtual speakers on the ears of the listener (col.3 line 35-50).

Re claim 31, the method of Claim 42, wherein the first and second output signals emulate the effects of multiple virtual speakers at any locations in a space around the listener (col.3 line 35-50; col.4 line 60-67).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DISLER PAUL whose telephone number is (571)270-1187. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian CHin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./  
Examiner, Art Unit 2614

/Vivian Chin/  
Supervisory Patent Examiner, Art Unit 2614